

Prospective supervisor's form

Name of the supervisor: Marcin Śliwiński

Academic title: DSc

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Gdańsk University of Technology Faculty of Electrical and Control Engineering

Department of Control Engineering

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Discipline: control, electronic and electrical engineering none Optional

Key words (obligatory four key words describing research interests / expertise):

Functional safety

Risk analysis

Probabilistic modelling

Cybersecurity

Bibliometric indicators

1. Number of journal publications in WoS/ Scopus 8/ 20

2. Citations excluding self-citations WoS 10 Scopus 24

3. Hirsch index WoS 2 Scopus 4

1. The number of PhD students who have graduated under your supervision: 0

2. The number of PhD students currently supervised:

a. within the current doctoral school 0

b. within doctoral studies (previous system) 0

3. Are you currently accepting new PhD students:

a. Polish Yes/No Yes

b. Foreign Yes/No Yes

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Research interests or topics offered for PhD research (no more than 2000 characters)ⁱⁱ

The goal of the research is to develop new methods enhancing the existing techniques to evaluate functional safety and security of computer control systems used in critical applications.

Critical applications, generally defined as those, which in case of failures may have severe consequences and negatively impact a large segment of the society, cause loss of life and limbs, or lead to larger financial losses, concern nearly every aspect of our lives. They include individual devices, such as medical or automotive, means of transportation, such as airplanes, ships and space vehicles, ways of regulating traffic on roads and railways, but also marine and aviation, larger critical infrastructure, such as power generation, nuclear or conventional, and energy distribution, as well as process industries (chemical and petroleum) and banking or commercial systems.

One way task to counteract the violations of critical system properties is to develop preventive measures in anticipation of potential failures. These countermeasures serve the purpose of protecting assets and rely mostly on developing respective defense mechanisms. The other side of the coin, however, is to assess the effectiveness of these techniques, which can be done by evaluating the system state to predict the negative consequences of unanticipated behavior.

Thus, the general aim of this research is to contribute to understanding of mechanisms governing the critical system behavior and develop new methods enhancing the existing techniques to evaluate critical system properties, such as functional safety and cybersecurity.

The potential PhD student should have some background at the:

- functional safety analysis,
- risk and reliability analysis like - RBD, FTA, FMEA and FMECA,
- SIL determining,
- SIL verification,
- probability modelling BPCS, DCS, SIS and E/E/PE systems,
- safety & security integration.

Funding or special equipment needed to carry out a PhD project ⁱⁱⁱ:

1. Is funding available for experimental work: *Yes/No/not needed*

Yes

2. Is the equipment needed to complete a PhD project

available in your lab/department: *Yes/No/not needed*

Yes

Most important publications – no more than 5 published after 1.01.2018

No	Authors/title/journal	Number of points according to the current list of the Ministry of Science and Higher Education	Publication year
1.	Śliwiński M.: Safety integrity level verification for safety-related functions with security aspects, Process Safety and Environmental Protection, ELSEVIER.	100	2018
2.	Śliwiński M.: Functional safety and information security in the critical infrastructure systems and objects. Monographs 171, Gdańsk University of Technology Publishing House.	80	2018

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3.			
4.			
5.			

Most recent externally funded projects you were involved in – no more than 3

No	Project title, the name of the Principal Investigator (PI) and the institution the project was carried out	Years	Role in the project ^{iv}
1.	HAZARD Interreg Baltic Sea Region: „Mitigating the effects of emergencies in the Baltic Sea Region ports 2016-2019 (European Union, European Regional Development Fund: 2016-2019)", Jarmo Malmsten, University of Turku - Lead Partner (and Hamburg University of Technology; Vilnius Gediminas Technical University; University of Paderborn; Polish Safety and Reliability Association)	2016-2019	R
2.			PI
3.			PI

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Additional relevant information (no more than 1600 characters)^v

No additional information.

- ⁱ You may select up to two disciplines out of 12 disciplines represented in the Doctoral School
- ⁱⁱ Observe the limit of not more than 2000 characters
- ⁱⁱⁱ Leave only one answer
- ^{iv} Select the role in the project: PI stands for principal investigator (refers to the holder of an independent grant and the lead researcher for the grant project), Co-I for co-investigator (Co-I assists the principal investigator in the management and leadership of the research project), R for researcher
- ^v Add any other relevant information e.g. awards for PhD students whom you supervised (no more than 1600 characters)